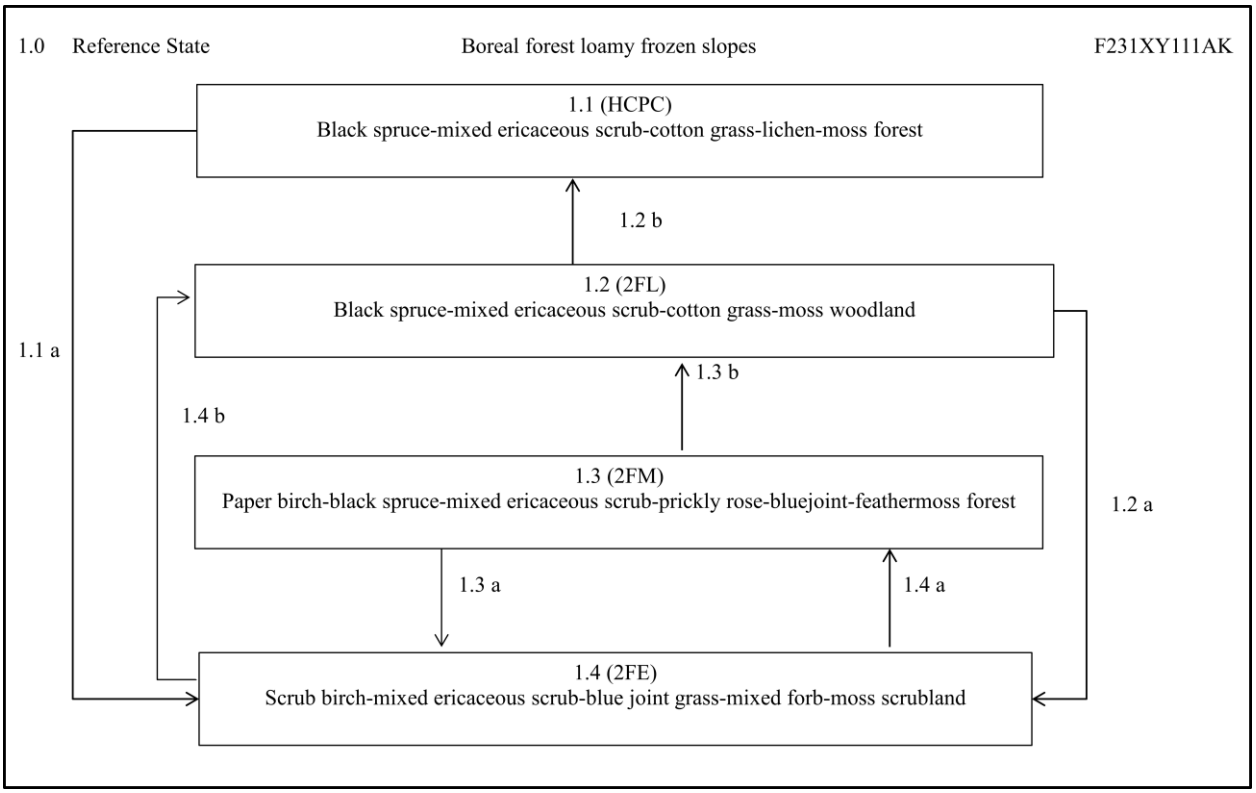
Ecological Site Description ID:	F231XY111AK

Ecological Dynamics of the Site:

This boreal ecological site occurred on summits, shoulders, and backslopes of hills and mountains at all aspects. Given the wide array in landscape position for this ecological site, slope varied substantially (i.e. 1-58%). For climax phase community, organic mat ranged from 10-40cm and soils had permafrost. For community phase 1.1, soils were classified as haplorthels or haploturbels and were composed of organic matter over loamy cryoturbate. Soils were typically saturated due in large part to thick organic mats. Climax phase was characterized as a black spruce forest with ericaceous shrub and moss dominated understory.

Fire was a disturbance regime that resulted in 4 documented phases. Fire is a natural and typically unmanaged disturbance regime. The typical fire return interval for coniferous forests of interior Alaska is approximately 100 years. For this ecological site, low-severity fire events are more typical then high-severity fire events. Low-severity and high-severity fire events appear to cause differences in the depth of organic material on the soil surface, presence and/or depth of permafrost, present vegetation, and potential vegetation.

State and Transition Diagram:



State ID Number:	1	State Name:	Reference
State Narrative:	Phases within the reference state were grouped on the structure and dominance of deciduous and coniferous trees which was believed to directly relate to time since last fire event and severity of burn. In a low-severity fire, minimal proportions of the organic mat are consumed and mineral soils will typically not be exposed. Permafrost typically remains in the soil profile, which often perches water. Graminoids and scrubs quickly recolonize and dominate a site using below ground root reserves that were not consumed in the fire event. Due to their semi-serotenous cones, black spruce quickly reestablishes after fire events. With the absence of fire, early fire sere communities associated with this disturbance regime are thought to progress to community phase 1.2. In a high-severity fire, large proportions of the organic mat are consumed and mineral soils will typically be exposed. Permafrost often drops out of the soil profile and the sites become drier. While many pre-fire species likely regenerate as mentioned above, conditions are suitable for the establishment and growth of species with wind-blown seed (e.g. paper birch, fireweed, willow). With the absence of fire, early fire sere communities associated with this disturbance regime are thought to progress to community phase 1.3. The fire return interval likely plays a large role in the structure of the black spruce forest. Longer fire return intervals favor development of community phase 1.1, while shorter fire return intervals favor development of community phases 1.2 or 1.3. Tall trees are defined as trees growing >40’ in height, medium trees are defined as growing 15-40’ in height, while stunted and regenerative trees are defined as growing less than 15’ in height. Tall shrubs are defined to grow greater than 10’ in height, medium shrubs are defined to grow 3-10’ in height, low shrubs are defined to grow 8” – 3’ in height, and dwarf shrubs are defined to grow less than 8” in height.		

Photo 1.1			
Community Phase Number:	1.1	Community Phase Name:	Black Spruce-Mixed Ericaceous Scrub-Cotton Grass-Lichen-Moss Forest
Community Phase Narrative:			
The majority of tree cover occurred in the medium and stunted tree stratum (total mature tree cover ~25%). While *Picea mariana* was the dominanat tree species, *Picea glauca* and *Betula neoalaskana* were often observed but had limited cover. The majority of scrub cover occurred in the low and dwarf stratums (total shrub cover was ~65%). Common shrubs include *Betula glandulosa*, *Ledum palustre*, *Vaccinium uliginosum*, *Rubus chamaemorus*, and *Vaccinium vitis-idaea*. Graminoids were less abundant then shrubs (~20% cover) and the most common species were *Carex bigelowii* and *Eriophorum vaginatum*. Forbs were a minor vegetative component. Lichen and moss were extensive ground covers (combined ~75% cover). The most common lichens were *Cladina sp*., while the most common moss species were *Sphagnum sp*., *Hylocomium splendens* and *Pleurozium schreberi*. This phase had 21 observations.			

Community Pathways	
Pathway Number	Pathway Name & Description
1.1a	Fire.

	For this ecological site, phase 1.1 has the longest fire return interval.

Photo 1.2			
Community Phase Number:	1.2	Community Phase Name:	Black Spruce-Mixed Ericaceous Scrub-Cotton Grass-moss Woodland
Community Phase Narrative:			
The majority of tree cover occurred in the medium, stunted, and regenerative tree stratums (total mature tree cover was ~20%). While *Picea mariana* was the dominanat tree species, *Betula neoalaskana* was commonly observed. The majority of shrub cover occurred in the low shrub stratum (total shrub cover was ~70%). Common shrubs include *Ledum palustre*, *Vaccinium uliginosum*, and *Vaccinium vitis-idaea*. While graminoids were less abundant when compared to phase 1.1, *Eriophorum vaginatum* was commonly observed. Forbs were a minor vegetative component. When compared to community phase 1.1, lichens had reduced overall cover (~20%). Moss was an extensive ground cover and common species included *Sphagnum sp*., *Hylocomium splendens* and *Pleurozium schreberi*. This phase had 18 observations.			

Community Pathways

Pathway Number	Pathway Name & Description
1.2 a	Fire.
1.2 b	Normal time and growth without fire. Black spruce woodland will mature and eventually become an open forest. Observations of paper birch in tree stand become less frequent. The fire return interval was presumed to be shorter then phase 1.1 but longer than phase 1.4.

Photo 1.3			
			
Community Phase Number:	1.3	Community Phase Name:	Paper Birch-Black Spruce-Mixed Ericaceous Scrub-Prickly Rose-bluejoint-Feathermoss Forest
Community Phase Narrative:			
Tree cover occurred in the medium and regenerative tree stratums (~30% mature tree cover). The tree stand was evenly split between *Betula neoalaskana* and *Picea mariana*. Shrubs occurred primarily in the low shrub stratum (total shrub cover was ~60%). Commonly observed shrubs included *Alnus viridis*, *Ledum palustre*, *Rosa acicularis*, and *Vaccinium vitis-idaea*. When compared to phase 1.1 and			

1.2, forb cover was much higher (~10% cover). Common forbs include *Lycopodium annotinum*, *Cornus canadensis*, and *Equisetum sylvaticum*. While *Calamagrostis canadensis* was a commonly observed species, graminoids were a minor vegetative component. Moss was an abundant ground cover (~35% cover) and the most common species was *Hylocomium splendens*. This phase had three observations.

Community Pathways	
Pathway Number	Pathway Name & Description
1.3 a	Fire.
1.3 b	Normal time and growth without fire event. Permafrost migrates upward into soil profile and eventually paper birch will be replaced by black spruce and ericaceous scrub community. Phase 1.3 was rarely observed and the associated transitions were the least understood for this ecological site. The fire return interval was presumed to be shorter then phase 1.1 but longer than phase 1.4.

Photo 1.4			
Community Phase Number:	1.4	Community Phase Name:	Scrub Birch-Mixed Ericaceous Scrub-Blue Joint Grass-Mixed Forb-Moss Scrubland

Community Phase Narrative:
While trees were observed in this phase, shrubs and graminoids were the dominanat form of vegetation. A limited amount of mature *Picea mariana* was often observed (~3% cover). Seedlings of *Picea mariana*, *Picea glauca*, *Populus tremuloides*, and *Betula neoalaskana* were observed but not abundant (~10% cover). Shrubs primarily occurred in the low shrub stratum (total shrub cover ~60%). Common shrubs include *Betula glandulosa*, *Ledum palustre*, *Vaccinium uliginosum*, and *Vaccinium vitis-idaea*. Graminoids were abundant (~30% cover) and the most common species was *Calamagrostis canadensis*. Forbs were less abundant then graminoids (~20% cover) and common species included *Equisetum sylvaticum* and *Chamerion angustifolium*. Moss was an abundant ground cover (~30%) but feathermoss was no longer dominant moss species observed at sites. This phase had 37 observations.

Community Pathways	
Pathway Number	Pathway Name & Description
1.4 a	Normal time and growth without fire. Scenario associated with a high-severity fire event. Less common disturbance event for this ecological site.
1.4 b	Normal time and growth without fire. Scenario associated with a low-severity fire event. Most common disturbance event for this ecological site. Average depth of soil organic matter was 13 cm after burn event for the 37 observations made in phase 1.4, which supports that exposing mineral soil would be a rare event for this ecological site.